REMARKS

Claims 1 and 21 are amended for purposes of expediting prosecution. Support for the amendment is provided by the example embodiments shown in FIGs. 1, 3, and 4 and described in paragraphs [0020]-[0023], and [0030]-[0038], for example. In the discussion set forth below, Applicants do not acquiesce to any rejection or averment in the Office Action unless expressly stated. Applicant believes that all pending claims are in condition for allowance and respectfully requests allowance of all the claims.

Double Patenting

Applicant respectfully submits that claims 1 and 21 are substantially different. For example, in claim 1 the evolving of a new design is from at least one design in the population. In contrast, in claim 21 the evolving of a replacement design uses at least two of the hardware designs in the population. In addition, in claim 21, the evolving and evaluating are repeated until the replacement hardware design produces a result signal that is within a selected range of result signals from the consensus result. There is no mention of repeating the evolving and evaluating in claim 1. Therefore, claims 1 and 21 are believed to not be substantial duplicates of one another.

Statutory Subject Matter Under 35 U.S.C. §101

Claims 1-23 are believed to be directed to statutory subject matter of 35 USC §101, and the rejection is respectfully traversed. However, the rejection is moot and should be withdrawn in view of the amendments to the claims.

Applicant respectfully submits that by virtue of each design in the population being programmed in a programmable device and generating an associated result signal, the claimed method is tied to a particular apparatus. Applicant also notes that in claim 1, an output is generated from the consensus result for operating the system, which is consistent with the preamble.

Therefore, claims 1-23 are directed to statutory subject matter, and the rejection should be withdrawn.

Definiteness Under 35 U.S.C. §112, Second Paragraph

Claims 1-20 are believed to be definite under 35 USC §112, second paragraph, and the rejection is respectfully traversed because the claims would be reasonably clear to those skilled in the art. However, the "selecting" step has been deleted for purposes of clarification, and the rejection should be withdrawn.

Novelty Under 35 U.S.C. §102(b)

Claims 1-2 and 5-33 are understood to be novel over "Vigander" ("Evolutionary Fault Repair of Electronics in Space Applications", by Vigander et al.) under 35 USC §102(b). The rejection is respectfully traversed because the Office Action does not show that all the limitations of the claims are taught by Vigander.

Applicant respectfully submits that Vigander's use of "elitism" does not correspond to the claimed "determining a consensus result as a function of at least two of the generated result signals; …evaluating the new design for consistency with the consensus result; [and] selecting for replacement at least one design as a function of the associated fitness level and in response to a result signal of the new design being within a selected range of result signals from the consensus result" as recited in claim 1.

Vigander describes the use of "elitism" as "the fittest individual was always cloned." (7.1.7). Vigander further describes the "fitness value" as being a "measurement of how good an individual is." (Appendix C). Fitness is measured with a "fitness function," which according to Vigander evaluates "how well an individual performs in the application." (Appendix C).

Vigander does not disclose the fitness function as being determined based on a "consensus result" as recited in claim 1. Nor does Vigander disclose replacing a design "in response to a result signal of the new design being within a selected range of result signals from the consensus result" as recited in claim 1.

The Examiner asserted that "since the majority vote is based on fittest of individual [sic], Elitism means the evolved design must product [sic] response within range of consensus result." (OA 4-20-09). Applicant does not understand the Examiner's explanation as related to the limitations of claim 1 and the teachings of Vigander. Applicant's claim 1 does not determine a majority vote based on the fittest

individuals in the population. Rather, claim 1 determines the consensus result as a function of at least two of the result signals generated from associated designs in the population. Thus, Applicant's claim 1 does not look to the fittest individuals in determining the consensus results.

As to Vigander, there is no apparent indication that Vigander considers a majority vote in determining fitness level of an individual. Rather Vigander teaches "the fitness of an individual is evaluated by testing all input combinations (2^8 = 256), and checking whether the result is correct. A fitness value is assigned as the number of correct minterms, or specific input combinations." (7.1.4). Thus, Vigander's fitness function knows "whether the result is correct" for each individual for all combinations of inputs and has no need for majority voting in determining fitness.

For the reasons set forth above, Applicant respectfully submits that the Examiner's premise ("since the majority vote is based on fittest of individual [sic]") is not supported by any of Applicant's claim, specification, or Vigander's teachings. Applicant further submits that the Examiner's conclusion ("Elitism means the evolved design must product [sic] response within range of consensus result.") does not follow from the Examiner's premise and is also neither taught nor suggested by Vigander.

If the Examiner's note has been misconstrued, Applicant respectfully requests an explanation that shows how Vigander's use of "elitism" is equivalent to the claimed use of the consensus result, both for determining fitness levels of each design in the population and for evaluating the new design for consistency with the consensus result.

Applicant submits that independent claims 21 and 25 are patentable at least for the reasons provided above with respect to claim 1. Claims 2 and 5-20 depend from claim 1, claims 22-23 depend from claim 21, and claims 27-33 depend from claim 25 (claims 24 and 26 are cancelled). Therefore, claims 1-2 and 5-33 are novel over Vigander, and the rejection should be withdrawn.

35 U.S.C. § 103(a)Rejections

Claims 3-4 are understood to be patentable under 35 USC §103(a) over Vigander in view of "Yao" (Making Use of Population Information in Evolutionary Artificial Neural Networks, IEEE 1998) to Yao. The rejection is respectfully traversed because the Office Action does not show that all the limitations are suggested by the combination and does not provide a proper motivation for modifying the teachings of Vigander with teachings of Yao.

Claims 3-4 depend from claim 1, and Yao neither teaches nor suggests those limitations of claim 1 which Vigander does not teach, as explained above. Therefore, the Office Action has not shown that the Vigander-Yao combination suggests all the limitations of claims 3-4 . The rejection of claims 3-4 should be withdrawn because a *prima facie* case of obviousness has not been established.

CONCLUSION

Reconsideration and a notice of allowance are respectfully requested in view of the Remarks presented above. If the Examiner has any questions or concerns, a telephone call to the undersigned is invited at (408) 879-4682.

Respectfully submitted,

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I hereby certify that this correspondence is being filed via EFS-Web with the United States Patent & Trademark Office on July 14, 2009.
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